

ABSTRACT

A p channel field effect transistor in which the sensitivity of an enzyme can be enhanced by immobilizing the enzyme directly on an FET channel surface (diamond surface), as well as a sensor including the same, is provided. A diamond surface (22) having mixed hydrogen terminals, oxygen terminals, and amino terminals is treated under the action of glutaraldehyde  $\text{OHC}(\text{CH}_2)_3\text{CHO}$  (30), so that the glutaraldehyde (30) is immobilized on the diamond surface (22) having mixed hydrogen terminals, oxygen terminals, and amino terminals. Subsequently, urease (29) is further applied thereto, so that the amino group (31) of the urease (29) is bonded to the glutaraldehyde (30). That is, the urease (29) can be immobilized on the diamond surface (22) having mixed hydrogen terminals, oxygen terminals, and amino terminals. When the urea concentration is increased from  $10^{-6}$  M to  $10^{-2}$  M, the threshold voltage shifts by about 0.1 V in the positive direction, and the sensitivity to urea concentration of 30 mV/decade is exhibited.